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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
FLEURANTIN, JEAN B	
ART UNIT	PAPER NUMBER
2172	25

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/420,509	FRANZ ET AL.	
	Examiner	Art Unit	
	Jean B Fleurantin	2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-88* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15,18-35,38-55,58-75 and 78-88* is/are rejected.

7)☒ Claim(s) *16,17,36,37,56,57,76 and 77* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *22,24*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 16, 2003 has been entered. Claims 1-88 remain pending for examination.

Information Disclosure Statement

2. The information disclosure statement (IDS) filed on 08/25/03 and 10/16/03 (Paper Numbers 22 and 24) complies with the provision of M.P.E.P. It has been placed in the application file. The information referred to therein has been considered as to merits (See attached form).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-15, 18-35, 38-55, 58-75 and 78-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 5,510,981 issued to Berger et al. ("hereinafter Berger") in view of U.S. Pat. No. 5,642,519 issued to Martin ("hereinafter Martin"), both submitted by the Applicant.

As per claims 1, 21 and 41, Berger discloses a method for evaluating similarity among a plurality of data structures (see col. 11, lines 63-65), and col. 28, lines 44-47, comprising:

"said database encoding relationships between semantic concepts represented by said plurality of entries" as the table (database) shows only those words that occur at least ten times and only the ten most frequency words of any class, the degree to which the classes capture both syntactic and semantic (semantic concept) aspects of English is quite surprising given that they were constructed from nothing more than counts of bigrams, (see col. 46, lines 1-10); and

"generating a match value using a relative entropy value corresponding to said at least one matching entry" as the word match score generator generates a word match score for each transformed source word and each target hypothesis, the word match score comprises an estimate of conditional probability of occurrence of the transformed source word (see equation 7, col. 53, lines 39-43), "said relative entropy value being calculated relative to an entropy value of a root entry of said plurality entries" as a statistical model enjoys in modeling translation from sequences of source words represented by a random variable F, to sequences of target words represented by a random variable E, is the cross entropy[3], (see equation 165, col. 24, lines 23-59), and see column 46, lines 23-30. Berger does not explicitly disclose steps of analyzing each structure of said plurality of data structures to generate at least one substructure comprising a linguist feature-value pair; and matching said at least one substructure to a database having a plurality of entries to obtain at least one matching entry based on a semantic concept associated with said linguist feature-value pair. However, Martin discloses step of matching result can then used for other pattern matches, passing along the feature-value pairs associated with it, (see Martin col. 24, lines 19-67). It would have been obvious to a person of ordinary skill in the art at

the time of the invention was made to modify the teachings of Berger and Martin with analyzing each structure of said plurality of data structures to generate at least one substructure comprising a linguist feature-value pair; and matching said at least one substructure to a database having a plurality of entries to obtain at least one matching entry based on a semantic concept associated with said linguist feature-value pair. Such modification would allow the combined teachings of Berger and Martin to improve the performance of the system and method to match linguistic structures using thesaurus information, and to provide a best guess of a permissible sequence of words spoken to natural language processor which purses the input words using the constructed fsa network and its augmentations applying a top-down recursive matching algorithm, (see Martin col. 25, lines 12-16).

As per claims 2, 22, 42 and 62, Berger teaches "a method further comprises creating said plurality of entries in said database" as a means for performing different steps for each possible informant site, possible informant sites are obtained from a table of such sites, (see col. 23, lines 46-57);

"processing said plurality of entries in said database" as a means for transforming the input series of source words also collapses multi-word units of input source words into source words and splits compound input source words into two or more transformed source words, (see col. 7, lines 17-21).

As per claims 3, 23, 43, 63 and 82, Berger teaches, "wherein said creating further comprises creating said plurality of entries using a tool having a graphical user interface and exporting said plurality of entries to said database" as a means for transforming the input series of source words also collapses multi-word units of input source words into source words and

splits compound input source words into two or more transformed source words, (see col. 7, lines 17-21).

As per claims 4, 24, 44, 64 and 83, in addition to claim 1, Berger further discloses "wherein said processing further comprises verifying said plurality of entries for validity" as a check is made to determine if the partial hypothesis is open, in other words if it contains an open target morpheme, (see col. 37, lines 6-20).

As per claims 5, 25, 45, 65 and 84, Berger discloses, "wherein said processing further comprises storing said each entry of said plurality of entries together with said corresponding relative entropy value in a compressed format", (see col. 24, lines 23-59).

As per claims 6, 26, 46, 66 and 85, Berger discloses "a method further comprising extracting from a lexicon database having a plurality of elements each element associated to said each structure" as a means for extracting pairs of sentences from this corpus such that each pair consists of a source and target sentence which are translations of each other, (see col. 61, lines 43-45), "assigning at least one code of said each element to said each structure" as encodes a source sentence f into an intermediate structure f' (see col. 24, lines 5-6), and "retrieving said at least one code during matching to obtain said at least one matching entry" as a means for extracting pairs of sentences from this corpus such that each pair consists of a source and target sentence which are translations of each other, (see col. 61, lines 43-45).

As per claims 7, 27, 47 and 67, Berger discloses, "reading lexical probability files and assigning a probability value to said each element of said plurality of elements in said lexicon database" as one such measure is the probability that the model assigns to the large sample of target structures, one judges as better the language model which yields the greater probability.

When the target structure is a sequence of words or morphs, this measure can be adjusted so that its takes account of the length of the structures, this leads to the notion of the perplexity of a language model with respect to a sample of text S, (see col. 39, lines 39-55).

As per claims 8, 28, 48, 68 and 86, Berger discloses, "wherein each structure of said plurality of data structures is a representation of a linguistic expression" as a means for transforming the input series of source words also collapses multi-word units of input source words into source words and splits compound input source words into two or more transformed source words, (see col. 7, lines 17-21).

As per claims 9, 18, 29, 38, 49, 58, 69, 78 and 87, Berger discloses, "wherein said database is a thesaurus hierarchy including a root entry, said plurality of entries depending from said root entry" as a means for resulting in a single class consisting of the entire vocabulary. The order in which the classes are merged determines a binary tree, the root of which corresponds to this single class and the leaves of which correspond to the words in the vocabulary, intermediate nodes of the tree correspond to groupings of words intermediate between single words and the entire vocabulary (see col. 46, lines 19-30).

As per claims 10, 19, 30, 39, 50, 59, 70, 79 and 88, Berger discloses, "wherein said relative entropy value corresponding to said each entry of said plurality of entries is calculated based on an entropy value of said each entry and an entropy value of said root entry" as a statistical model enjoys in modeling translation from sequences of source words represented by a random variable F, to sequences of target words represented by a random variable E, is the cross entropy[3], (see equation 165, col. 24, lines 23-59), and see column 46, lines 23-30.

As per claims 11, 20, 31, 40, 51, 60, 71 and 80, Berger discloses, "wherein said each element in said lexicon database is a word", (see col. 1, line 67 to col. 2, line 2).

As per claims 12, Berger discloses a method for evaluating similarity among a plurality of data structures (see col. 11, lines 63-65), and col. 28, lines 44-47, comprising:

"said database encoding relationships between semantic concepts represented by said plurality of entries" as the table (database) shows only those words that occur at least ten times and only the ten most frequency words of any class, the degree to which the classes capture both syntactic and semantic (semantic concept) aspects of English is quite surprising given that they were constructed from nothing more than counts of bigrams, (see col. 46, lines 1-10); and

"calculating a relative entropy value corresponding to each entry of said plurality of entries" as the word match score generator generates a word match score for each transformed source word and each target hypothesis, the word match score comprises an estimate of conditional probability of occurrence of the transformed source word (see equation 7, col. 53, lines 39-43), "said relative entropy value being calculated relative to an entropy value of a root entry of said plurality entries" as a statistical model enjoys in modeling translation from sequences of source words represented by a random variable F, to sequences of target words represented by a random variable E, is the cross entropy[3], (see equation 165, col. 24, lines 23-59), and see column 46, lines 23-30. Berger does not explicitly disclose steps of creating a plurality of entries in a database for subsequent comparison with linguist feature-value pairs based on semantic concepts associated with said linguist feature-value pairs. However, Martin discloses step of matching result can then used for other pattern matches, passing along the feature-value pairs associated with it, (see Martin col. 24, lines 19-67). It would have been

obvious to a person of ordinary skill in the art at the time of the invention was made to modify the teachings of Berger and Martin with analyzing each structure of said plurality of data structures to generate at least one substructure comprising a linguist feature-value pair; and matching said at least one substructure to a database having a plurality of entries to obtain at least one matching entry based on a semantic concept associated with said linguist feature-value pair. Such modification would allow the combined teachings of Berger and Martin to improve the performance of the system and method to match linguistic structures using thesaurus information, and to provide a best guess of a permissible sequence of words spoken to natural language processor which purses the input words using the constructed fsa network and its augmentations applying a top-down recursive matching algorithm, (see Martin col. 25, lines 12-16).

As per claims 13, 33, 53 and 73, Berger discloses "a method further comprising storing said each entry of said plurality of entries together with said corresponding relative entropy value in a compressed format", (see col. 24, lines 23-59).

As per claims 14, 34 and 54, Berger discloses "a method further comprising: creating said plurality of entries using a tool having a graphical user interface" as a means for transforming the input series of source words also collapses multi-word units of input source words into source words and splits compound input source words into two or more transformed source words, (see col. 7, lines 17-21); and

"exporting said plurality of entries to said database" as a means for extracting pairs of sentences from this corpus such that each pair consists of a source and target sentence which are translations of each other, (see col. 61, lines 43-45).

As per claims 15, 35, 55 and 75, in addition to claims 1 and 12, Berger discloses, "matching said at least one substructure to a database having a plurality of entries to obtain at least one matching entry" as the word match score generator generates a word match score for each transformed source word and each target hypothesis, the word match score comprises an estimate of conditional probability of occurrence of the transformed source word, (see equation 7, col. 53, lines 39-43);

"generating a match value using said relative entropy value corresponding to said at least one matching entry" as a statistical model enjoys in modeling translation from sequences of source words represented by a random variable F, to sequences of target words represented by a random variable E, is the cross entropy[3], (see equation 165, col. 24, lines 23-59), and see column 46, lines 23-30.

As per claims 32, 52 and 72, in addition to claim 1, Berger discloses "creating a plurality of entries in a database" as a means for performing different steps for each possible informant site, possible informant sites are obtained from a table of such sites, (see col. 23, lines 46-57).

As per claim 61, Berger discloses a system for evaluating similarity among a plurality of data structures (see col. 11, lines 63-65), and col. 28, lines 44-47, comprising:

"said database encoding relationships between semantic concepts represented by said plurality of entries" as the table (database) shows only those words that occur at least ten times and only the ten most frequency words of any class, the degree to which the classes capture both syntactic and semantic (semantic concept) aspects of English is quite surprising given that they were constructed from nothing more than counts of bigrams, (see col. 46, lines 1-10); and

"means for generating a match value using a relative entropy value corresponding to said at least one matching entry" as the word match score generator generates a word match score for each transformed source word and each target hypothesis, the word match score comprises an estimate of conditional probability of occurrence of the transformed source word (see equation 7, col. 53, lines 39-43), "said relative entropy value being calculated relative to an entropy value of a root entry of said plurality entries" as a statistical model enjoys in modeling translation from sequences of source words represented by a random variable F, to sequences of target words represented by a random variable E, is the cross entropy[3], (see equation 165, col. 24, lines 23-59), and see column 46, lines 23-30. Berger does not explicitly disclose steps means for analyzing each structure of said plurality of data structures to generate at least one substructure comprising a linguist feature-value pair; and means for matching said at least one substructure to a database having a plurality of entries to obtain at least one matching entry based on a semantic concept associated with said linguist feature-value pair. However, Martin discloses step of matching result can then used for other pattern matches, passing along the feature-value pairs associated with it, (see Martin col. 24, lines 19-67). It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to modify the teachings of Berger and Martin with analyzing each structure of said plurality of data structures to generate at least one substructure comprising a linguist feature-value pair; and matching said at least one substructure to a database having a plurality of entries to obtain at least one matching entry based on a semantic concept associated with said linguist feature-value pair. Such modification would allow the combined teachings of Berger and Martin to improve the performance of the system and method to match linguistic structures using thesaurus information, and to provide a best

guess of a permissible sequence of words spoken to natural language processor which purses the input words using the constructed fsa network and its augmentations applying a top-down recursive matching algorithm, (see Martin col. 25, lines 12-16).

As per claim 74, Berger discloses "a method further comprising: means for creating said plurality of entries using a tool having a graphical user interface" as a means for transforming the input series of source words also collapses multi-word units of input source words into source words and splits compound input source words into two or more transformed source words, (see col. 7, lines 17-21); and

"means for exporting said plurality of entries to said database" as a means for extracting pairs of sentences from this corpus such that each pair consists of a source and target sentence which are translations of each other, (see col. 61, lines 43-45).

As per claim 81, in addition to claim 1, Berger discloses, "a database having a plurality of entries" as a means for performing different steps for each possible informant site, possible informant sites are obtained from a table of such sites, (see col. 23, lines 46-57).

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Claim Objections

4. Claims 16, 17, 36, 37, 56, 57, 76 and 77 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not teach or suggest in combination with other elements,

verifying said plurality of entries for validity;

extracting from a lexicon database having a plurality of elements each element associated to said each structure;

reading lexical probability files;

assigning a probability value to said each element of said plurality of elements in said lexicon database;

assigning at least one code of said each element to said each structure;

retrieving and matching said at least one code to said database to obtain said at least one matching entry as recited in claims 16, 36, 56 and 76.

CONTANT INFORMATION

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B Fleurantin whose telephone number is 703-308-6718. The examiner can normally be reached on 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John B Breene can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jean Bolte Fleurantin

April 6, 2004

SHAHID ALAM
PRIMARY EXAMINER